



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------|------------------------|
| 10/500,781 | | Stephen Temple | 27754/24347 | 8460 |
| 4743 | 7590 | 12/20/2007 | | |
| MARSHALL, GERSTEIN & BORUN LLP 233 S. WACKER DRIVE, SUITE 6300 SEARS TOWER CHICAGO, IL 60606 | | | EXAMINER SOLOMON, LISA | |
| | | | ART UNIT 2861 | PAPER NUMBER |
| | | | MAIL DATE 12/20/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-----------------|-----------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/500,781 | TEMPLE, STEPHEN | |
| | Examiner | Art Unit | |
| | Lisa M. Solomon | 2861 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) 5,7,9,10,16-18,20,21,26-59 and 61-68 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22 is/are allowed.
- 6) ☒ Claim(s) 1-4,6,8,11-15,19,23-25,55 and 60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 5, 7, 9-10, 16-18, 20, 21, 26-54, 57-59, and 61-68 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on June 18, 2007.

Note: Claim 47 is withdrawn from further consideration as the subject matter is drawn to nonelected subject matter.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-4, 19, and 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kitahara et al. (20020018097).

In regards to claim 1, *Kitahara et al. (20020018097)* teaches a droplet deposition apparatus (10, Fig. 1) for depositing droplets on a substrate (28, Fig. 2) and comprising an elongate printhead (3, Fig. 4), the substrate (28) being movable relative to the printhead (3) in a substrate movement direction (D0, Fig. 3) and the length of the printhead (3) extending in a printhead direction (E0, Fig. 3) orthogonal to the substrate movement direction (D0) [Paragraph 75 lines 1-2; 6-8, Paragraph 77, Fig. 4], wherein the printhead (3) comprises at least two print head units ((35a-35d) – (38a-38d), Fig. 4)

spaced in the printhead direction (E0), each print head unit ((35a-35d) – (38a-38d), Fig.

4) comprising at least two parallel rows of nozzles (35a1a, 35a1b, etc., Fig. 5)

extending in the printhead direction (E0) with the rows being spaced apart in the substrate movement direction (D0) [Paragraph 93 lines 1-5, See also Fig. 5]; an

actuator for effecting the selective ejection of droplets from respective nozzles 35a1a, 35a1b, etc) and a droplet fluid supply arrangement disposed such that a different fluid

may be supplied to each row of nozzles (35a1a, 35a1b, etc) [Paragraph 82 lines 6-7

and Paragraph 87-90], wherein said units ((35a-35d) – (38a-38d)) are arranged such

that a nozzle row of one unit combines with a nozzle row from a different unit to form an

array wherein the nozzles (35a1a, 35a1b, etc) within an array are supplied with the

same ejection fluid and wherein the gap spacing between the end nozzle of one row in

an array and the neighboring end nozzle of a different row in said array is greater than

the inter-nozzle spacing within either of the rows [Paragraphs 87-90, 93-97, and 109-

110].

In regards to claim 3, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 1, wherein each nozzle (35a1a, 35a1b, etc) in one row of nozzles (35a1a, 35a1b, etc) is aligned in position in the printhead direction (E0) with a nozzle (35a1a, 35a1b, etc) in each of the other rows of nozzles [See Fig. 5].

In regards to claim 4, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 1, wherein each row of nozzles has the same length [See Fig. 5].

In regards to claim 19, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 1, wherein said array is linear [See Fig. 5].

In regards to claims 23-24, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 1 further comprising a transporter (2, Figs. 1 and 3) for supplying a printable substrate (28) to a print zone disposed to receive droplets ejected from said nozzles (35a1a, 35a1b, etc) and wherein a paper transporter (2) supplies said printable substrate (28) to said print zone in said substrate movement direction [Paragraph 75 lines 6-8, Paragraph 76 lines 1-4, and Paragraph 77].

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Kitahara et al. (20020018097)* in view of *Matsumoto et al. (20020008731)*.

In regards to claim 2, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 1 [see rejection above]. However, *Kitahara et al. (20020018097)* does not teach each printhead unit comprises at least three rows of nozzles, with each row of nozzles receiving from the supply arrangement a different color of ink.

Matsumoto et al. (20020008731) teaches each printhead unit comprises at least three rows of nozzles, with each row of nozzles receiving from the supply arrangement a different color of ink [Paragraphs 77-78, See also Fig. 5].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide each printhead unit comprises at least three rows of nozzles, with each row of nozzles receiving from the supply arrangement a different color of ink as taught by *Matsumoto et al. (20020008731)* in the apparatus of *Kitahara et al. (20020018097)* for the purposes of recording a multicolor image [*Matsumoto et al. (20020008731)* Paragraph 77 lines 6-8].

Claims 6, 8, 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kitahara et al. (20020018097)* in view of *Hirota et al. (6,758,553)*.

In regards to claim 6, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 1, wherein the actuator for effecting the selective ejection of droplets from respective nozzles [Paragraph 82 lines 6-7 and Paragraph 87-90]. However, *Kitahara et al. (2002018097)* does not teach the actuator comprises for each nozzle a pressure chamber in communication with the nozzle and in communication with the fluid supply arrangement.

Hirota et al. (553') teaches an actuator comprises for each nozzle a pressure chamber in communication with the nozzle and in communication with the fluid supply arrangement [Column 3 line 53-Column 4 line 6].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an actuator that comprises for each nozzle a pressure chamber in communication with the nozzle and in communication with the fluid supply arrangement as taught by Hirota et al. (553') in the apparatus of Kitahara et al. (20020018097) for the purposes of providing a main body of the printhead [Hirota et al. (553') Column 3 lines 26-27].

In regards to claim 8, *Kitahara et al. (20020018097) in combination with Hirota et al. (553')* teaches the apparatus according to claim 6 [see rejection above]. However, Kitahara et al. (20020018097) does not teach wherein said pressure chambers comprise at least one wall of piezoelectric material.

Hirota et al. (553') further teaches wherein said pressure chambers comprise at least one wall of piezoelectric material [Column 4 lines 53-65, See also the upper wall on Fig. 3].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide said pressure chambers comprise at least one wall of piezoelectric material as taught by Hirota et al. (553') in the apparatus of Kitahara et al. (20020018097) for the purposes of providing a compact printhead [Hirota et al. (2002018097) Column 1 lines 60-64].

In regards to claim 11, *Kitahara et al. (20020018097) in combination with Hirota et al. (553')* teaches the apparatus according to claim 6 [see rejection above]. However,

Kitahara et al. (20020018097) does not teach wherein the pressure chambers corresponding with one row of nozzles are provided in a row of pressure chambers on a base, with the pressure chambers corresponding with each other row of nozzles being provided in a respective other row of pressure chambers on the same base.

Hirota et al. (553') further teaches wherein the pressure chambers corresponding with one row of nozzles are provided in a row of pressure chambers on a base, with the pressure chambers corresponding with each other row of nozzles being provided in a respective other row of pressure chambers on the same base [Column 3 lines 31-43, Column 4 lines 53-65, See also Figs. 2 and 3].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the pressure chambers corresponding with one row of nozzles are provided in a row of pressure chambers on a base, with the pressure chambers corresponding with each other row of nozzles being provided in a respective other row of pressure chambers on the same base as taught by *Hirota et al. (553')* in the apparatus of *Kitahara et al. (20020018097)* for the purposes of causing the volume in the pressure chambers to increase upon deformation of the actuators to eject ink from the nozzle [*Hirota et al. (553')* Column 5 lines 18-23].

In regards to claim 12, *Kitahara et al. (20020018097)* in combination with *Hirota et al. (553')* teaches apparatus according to claim 11 [see rejection above]. However, *Kitahara et al. (20020018097)* does not teach wherein there are provided on the base, a divider to define around each row of chambers a fluid manifold region for use in the

supply of fluid to the chambers of that row, the respective manifold regions being separate from each other.

Hirota et al. (553') teaches wherein there are provided on the base, a divider to define around each row of chambers a fluid manifold region for use in the supply of fluid to the chambers of that row, the respective manifold regions being separate from each other [Column 5 lines 6-22, See also Fig. 7].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a base, a divider to define around each row of chambers a fluid manifold region for use in the supply of fluid to the chambers of that row, the respective manifold regions being separate from each other as taught by *Hirota et al. (553')* in the apparatus of *Kitahara et al. (20020018097)* for the purposes of supplying ink to the pressure chambers [*Hirota et al. (553')* Column 5 lines 8-18].

In regards to claim 13, *Kitahara et al. (20020018097)* in combination with *Hirota et al. (553')* teaches apparatus according to claim 12 [see rejection above]. However, *Kitahara et al. (20020018097)* does not teach wherein ports are defined in the base for communication with each fluid manifold region.

Hirota et al. (553') teaches wherein ports are defined in the base for communication with each fluid manifold region [Column 5 lines 15-23, See also Fig. 2].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide ports that are defined in the base for communication with each fluid manifold region as taught by *Hirota et al. (553')* in the apparatus of *Kitahara*

et al. (20020018097) for the purposes of providing conduits through which ink is supplied to the pressure chambers [Hirota et al. (553') Column 5 lines 8-14].

In regards to claim 14, *Kitahara et al. (20020018097) in combination with Hirota et al. (553')* teaches apparatus according to claim 13 [see rejection above]. However, *Kitahara et al. (20020018097)* does not teach wherein at least two ports communicate with each manifold region to prove a flow through each chamber.

Hirota et al. (553') teaches wherein at least two ports communicate with each manifold region to proved a flow through each chamber [Column 5 lines 15-23, See also Fig. 2].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide at least two ports communicate with each manifold region to proved a flow through each chamber as taught by *Hirota et al. (553')* in the apparatus of *Kitahara et al. (20020018097)* for the purposes of providing conduits through which ink is supplied to the pressure chambers [Hirota et al. (553') Column 5 lines 8-14].

In regards to claim 15, *Kitahara et al. (20020018097) in combination with Hirota et al. (553')* teaches apparatus according to claim 11 [see rejection above]. However, *Kitahara et al. (20020018097)* does not teach wherein the base is planar and the divider

comprises an apertured divider plate with said apertures defining the respective manifold regions.

Hirota et al. (553') teaches wherein the base is planar and the divider comprises an apertured divider plate with said apertures defining the respective manifold regions [Column 3 lines 31-42, Column 4 lines 23-31, See Fig. 2].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the base to be planar and the divider comprises an apertured divider plate with said apertures defining the respective manifold regions as taught by *Hirota et al. (553')* in the apparatus of *Kitahara et al. (20020018097)* for the purposes of providing a narrow channel for ink to be supplied to the pressure chambers [*Hirota et al. (553')* Column 5 lines 14-18].

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Kitahara et al. (20020018097)* in view of *Mizusawa et al. (4,677,448)*.

In regards to claim 25, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 23 [see rejection above]. However, *Kitahara et al. (20020018097)* does not teach said paper transporter comprises a paper-handling drum.

Mizusawa et al. (448') teaches a paper transporter comprises a paper-handling drum [Column 5 line 61-Column 6 line 13].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a paper transporter comprises a paper-handling drum as taught by *Mizusawa et al. (448')* in the apparatus of *Kitahara et al. (20020018097)* for

the purposes of providing means to transport a recording paper [Mizusawa 1et al. (448') see Fig. 5].

Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitahara et al. (20020018097) in view of Yabe (20020041307).

In regards to claim 55, *Kitahara et al. (20020018097)* teaches the apparatus according to claim 1 [see rejection above]. However, Kitahara et al. (20020018097) does not teach wherein said head units are mounted to an ink supply unit.

Yabe (20020041307) teaches wherein said head units are mounted to an ink supply unit [Paragraph 71].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide said head units are mounted to an ink supply unit as taught by Yabe (20020041307) in the apparatus of Kitahara et al. (20020018097) for the purposes of completing the printhead [Yabe (20020041307) Paragraph 71 lines 1-2].

Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over of Kitahara et al. (20020018097) in view of Yabe (20020041307) as applied to claim 55 in further view of Silverbrook (20020024569).

In regards to claim 55, *Kitahara et al. (20020018097)* in combination with *Yabe (20020041307)* teaches the apparatus according to claim 55 [see rejection above]. However, Kitahara et al. (20020018097) and both Yabe (20020041307) do not teach

wherein said ink supply unit comprises a plurality of supply cavities each communicating with a respective array.

Silverbrook (20020024569) teaches wherein said ink supply unit comprises a plurality of supply cavities each communicating with a respective array [Abstract, Paragraphs 7, 9, and 283, See also Figs. 96-97].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide said ink supply unit comprises a plurality of supply cavities each communicating with a respective array taught by *Silverbrook (20020024569)* in the apparatus of *Kitahara et al. (20020018097)* in combination with *Yabe (20020041307)* for the purposes of holding separate color inks [*Silverbrook (20020024569)* Paragraph 9 lines 5-6].

Allowable Subject Matter

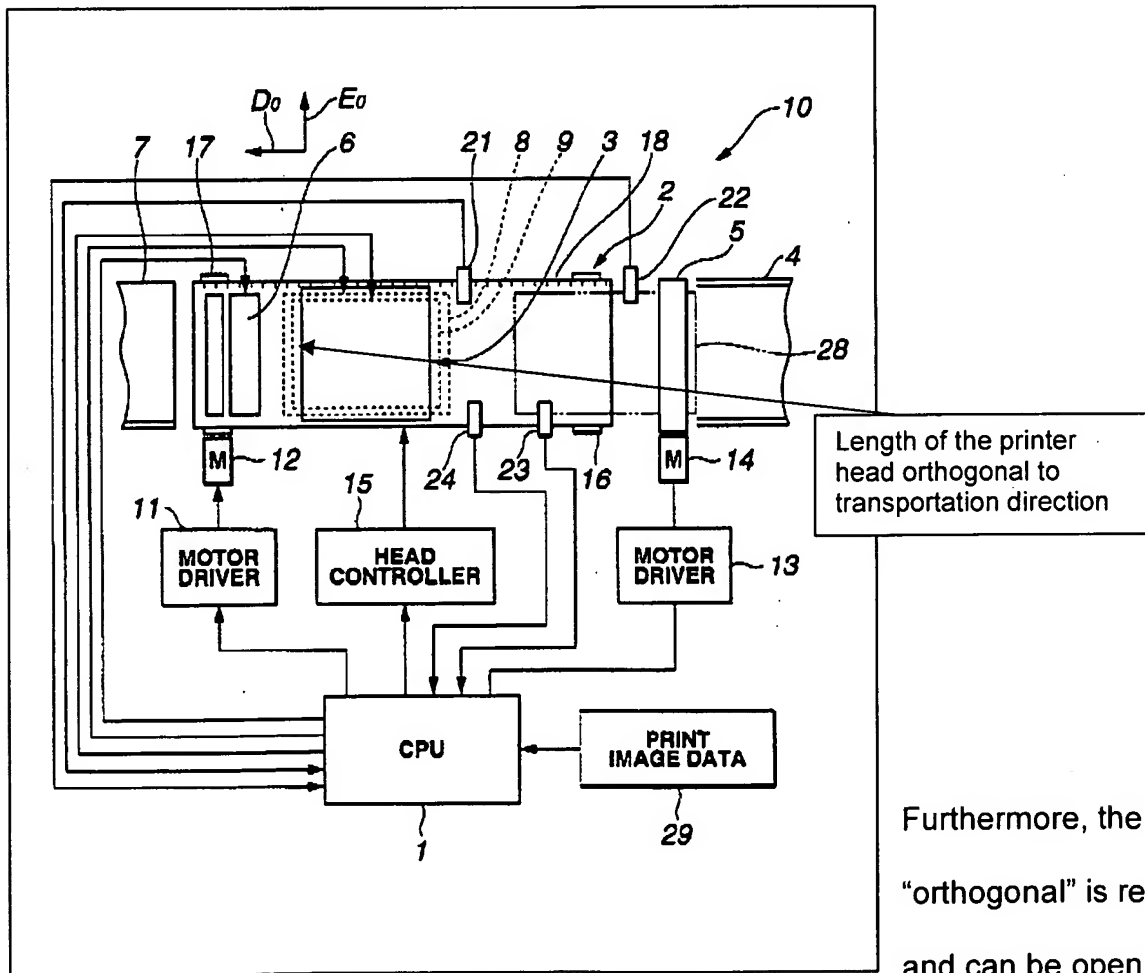
6. Claim 22 has been allowed.

The following is a statement of reasons for the indication of allowable subject matter: The primary reason for the allowance of claim 22 is the inclusion of limitation of the droplet deposition apparatus that includes "said gap spacing equals the row length plus twice the inter-nozzle spacing". It is this limitation found in the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Response to Arguments

7. Applicant's arguments filed September 28, 2007 have been fully considered but they are not persuasive. The Applicant argues that the language of the claim states that

the "printhead must be elongate, with the length of this elongate printhead orthogonal to the substrate movement direction" and that by contrast the printer head of the prior art reference Kitahara is parallel to the transportation direction. The Examiner respectfully disagrees. The printer head of prior art reference Kitahara is elongate and has a length that is orthogonal to the transportation direction/substrate movement direction. As can be seen in Fig. 1, the length that is extending in the printhead direction is orthogonal to the transportation direction/substrate movement direction.



interpretation. Therefore, the Examiner has used the broadest and most reasonable interpretation of orthogonal.

The Applicant has also chosen to argue that the transportation belt of the prior art reference Kitahara must maintain a constant speed parallel to the printhead over the entire length of the printhead to avoid errors in the droplet placement, which is in contrast to the present invention in which the printhead elongate orthogonal to the substrate movement direction requires the substrate velocity parallel to the printhead is constant over a much shorter length thus requiring much less complex paper handling machinery. As an example the Applicant points to the drum used in the present invention in contrast to the belt used in the prior art. The Examiner submits that the Applicant is arguing limitations and structure (i.e. the drum) that are not mentioned in the claim.

The Applicant further argues that the each group of printheads in the prior art reference Kitahara are distributed along an oblique line, with the groups being mutually separated in the transportation direction/substrate movement direction and that this feature ensures that the printer head is necessarily elongate parallel to the transportation direction. The Examiner submits that the arrangement or distribution of the groups of printhead units in the printer head does not matter. The Examiner again points to Fig. 1 in which there is a length that is orthogonal to the transportation direction/substrate movement direction. Furthermore, the Examiner does not agree with the statement "this feature ensures that the printer head is necessarily elongate parallel to the transportation direction" and that to adapt the device to be elongate orthogonal to

the transportation direction would contradict the clear and consistent technical teaching of the document. The Examiner submits that this is merely an assumption on the Applicant's part. The prior art reference Kitahara does not teach that "this feature ensures that the printer head is necessarily elongate parallel to the transportation direction". However, it does teach that the oblique lines meet the transportation direction/substrate movement direction in a predetermined inclination, which hardly ensures that the printer head is necessarily elongate parallel to the transportation direction. As mentioned before, the prior art reference Kitahara teaches the printer head is elongate orthogonal to the transportation direction/substrate movement direction. Therefore, there is no need for the device to be adapted and no contradiction to the clear and consistent technical teaching of the document exists.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

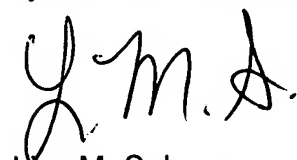
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Application/Control Number:
10/500,781
Art Unit: 2861

Page 16

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa M. Solomon whose telephone number is (571) 272-1701. The examiner can normally be reached on Monday - Friday from 8:00 am - 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Lisa M. Solomon
Patent Examiner
12/11/2007



MATTHEW LUU
SUPERVISORY PATENT EXAMINER